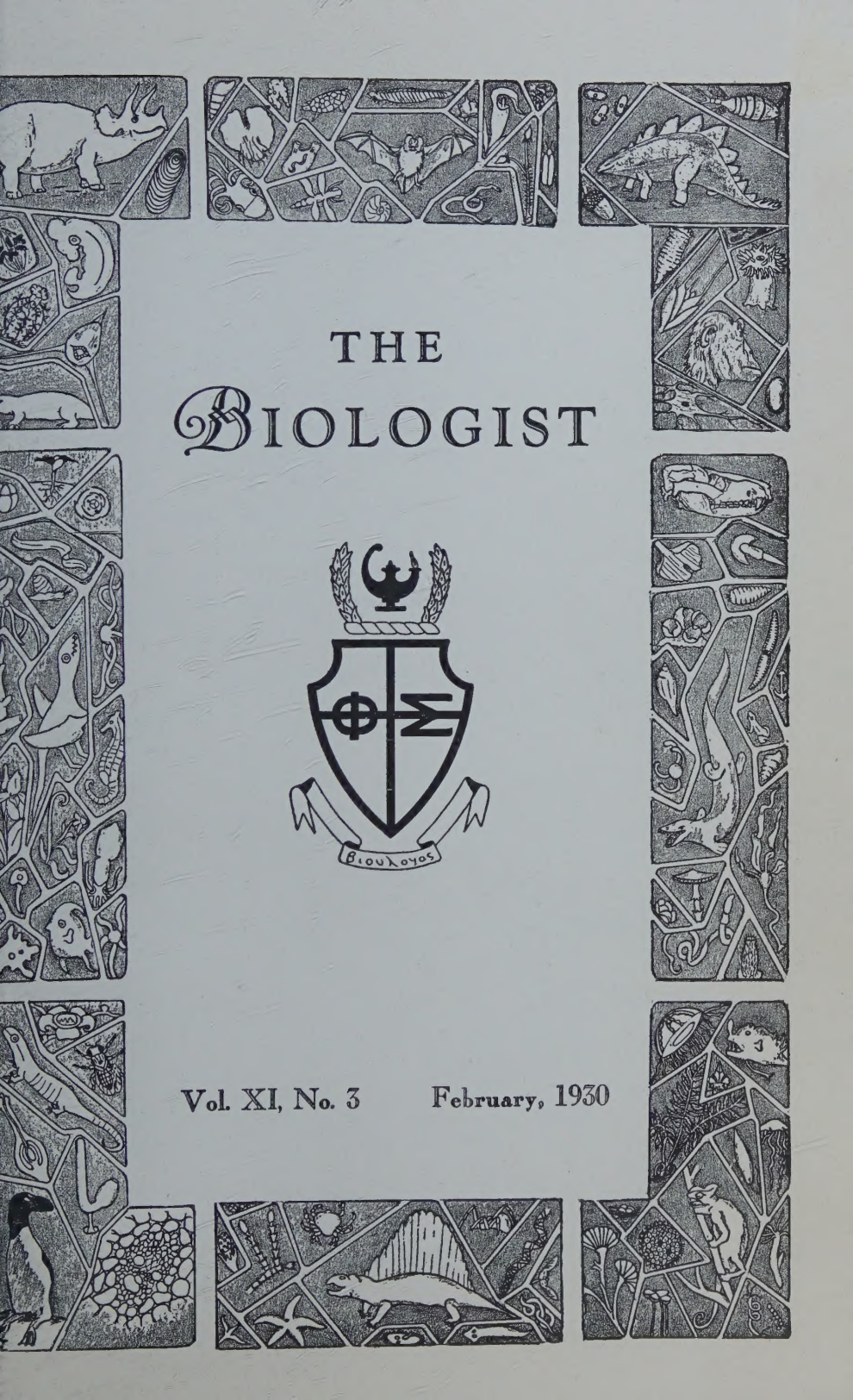




# THE BIOLOGIST



Vol. XI, No. 3

February, 1930



# THE BIOLOGIST

OFFICIAL QUARTERLY PUBLICATION

OF THE

PHI SIGMA SOCIETY

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# PHI SIGMA SOCIETY

An Organization Devoted to the Promotion of Interest in Research  
in the Biological Sciences, Founded Ohio State  
University, March 17, 1915.

## COUNCIL

### President

Dr. Paul B. Sears, (Alpha '16), Botany Department,  
University of Oklahoma, Norman, Oklahoma

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Dr. A. I. Ortenburger, (Beta '19), Zoology Department,  
University of Oklahoma, Norman, Oklahoma

### Treasurer

Erwine Hall Stewart, (Epsilon '17), Mesa, Colorado

## DIRECTORY of the ACTIVE CHAPTERS

### (Secretaries)

#### OHIO STATE

(Alpha) (*Inactive*) Ohio State University, Columbus, Ohio.

#### MICHIGAN

(Beta) Evelyn Dressel, Natural Science Building, University of  
Michigan, Ann Arbor, Michigan.

#### NORTH DAKOTA

(Gamma) (*Inactive*) North Dakota Agricultural College, Agricultural  
College, North Dakota.

#### MAINE

(Delta) Phyllis Gould, Balentine Hall, University of Maine, Orono, Maine.

#### DENVER

(Epsilon) Ethel Glandon, 2059 So. Fillmore, Denver, Colorado.

#### WISCONSIN

(Zeta) S. L. Leonard, Department of Zoology, University of Wisconsin,  
Madison, Wisconsin.

#### AKRON

(Eta) Dorothy Schneider, 90 Charlotte Street, Akron, Ohio.

#### MICHIGAN STATE

(Theta) W. F. Allen, Department of Chemistry, Michigan State College,  
East Lansing, Michigan.

#### WASHINGTON UNIVERSITY

(Iota) Betty R. Monaghan, McMillan Hall, Washington University,  
St. Louis, Missouri.

#### KANSAS

(Kappa) Louise Fulton, Department of Zoology, University of Kansas,  
Lawrence, Kansas.

MONTANA

- (Lambda) Paul Lemmon, Department of Biology, University of Montana, Missoula, Montana.

CALIFORNIA

- (Mu) Esther Perry, 320 Hilgard Hall, University of California, Berkeley, California.

WASHINGTON AND JEFFERSON

- (Nu) Marlin W. Helfrick, Phi Pi Phi House, Washington, Pennsylvania.

NEBRASKA

- (Xi) Elizabeth Pinkerton, 2415 Garfield Avenue, Lincoln, Nebraska.

NORTH DAKOTA

- (Omicron) (*Inactive*) University of North Dakota, Grand Forks, N. D.

EMORY

- (Pi) W. B. Redmond, P. O. Box 534, Emory University, Georgia.

ILLINOIS

- (Rho) Margaret L. Plant, 311 Women's Building, University of Illinois, Urbana, Illinois.

FLORIDA

- (Sigma) John Tower, Department of Biology, University of Florida, Gainesville, Florida.

DUKE

- (Tau) L. C. Chesley, Department of Zoology, Duke University, Durham, North Carolina.

MIAMI

- (Upsilon) Charles Collins, Miami University, Oxford, Ohio.

NEW HAMPSHIRE

- (Phi) Ruth Thompson, Department of Zoology, University of New Hampshire, Durham, New Hampshire.

MONTANA STATE

- (Chi) Virginia Mills, Lewis Hall, Montana State College, Bozeman, Montana.

WASHINGTON

- (Psi) Marjorie Wells, Department of Zoology, University of Washington, Seattle, Washington.

OKLAHOMA

- (Omega) Helen N. Vincent, Department of Botany, University of Oklahoma, Norman, Oklahoma.

SOUTHERN CALIFORNIA

- (Alpha Alpha) N. Ellen Denning, 1250 So. Los Robles Avenue, Pasadena, California.

MOUNT UNION

- (Alpha Beta) Floyd O. Atchley, 547 East State Street, Alliance, Ohio.

SOUTH DAKOTA

- (Alpha Gamma) Donald Miller, 25 N. University, Vermillion, S. D.

LAWRENCE

- (Alpha Delta) Eva Mossholder, Botany Laboratory, Lawrence College, Appleton, Wisconsin.

PITTSBURGH

- (Alpha Epsilon) Ruth Shaw, Department of Zoology, University of Pittsburgh, Pittsburgh, Pennsylvania.



## DINOSAURS

A Rhyme of Brain and Brawn

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By WALTER C. KRAATZ, (*Zeta*, '17)  
University of Akron

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In the Mesozoic Age,  
Found by scientific sage,  
Lived the famous dinosaurs.  
Some of them were herbivores,  
Plodding over marsh and ground,  
Munching on the plants they  
found;  
Heavy, old Diplodocus,  
Others also ponderous,  
Great big Brontosaurus,  
Bigger still Gigantosaurus.  
Somewhat smaller and less massive,  
And not nearly so impassive,  
Were the fierce-jawed Allosaurus,  
Terrible Tyrannosaurus.  
Others too of curious mien,  
Rose on Mesozoic scene,  
Triceratops horny spread,  
But with little in the head.  
Some related ones however,  
Made a very new endeavor,  
Leathery wings took to the air,  
Flying clumsily up there.  
But this reptile evolution  
Ended though in dissolution.  
All of dinosaurian lines

Fell upon some evil times,  
For despite their brawny frame,  
All of them had little brain.

From some other reptile start,  
Warmer blood fit for the part,  
Feathered birds took to the air,  
Masters of the realm up there.

And from other reptiles lowly,  
Mammals formed a new group  
slowly,  
Blood all warm and fur for covers,  
Method making better mothers,  
And with brain of larger size,  
These adaptive creatures wise,  
Soon were rulers of the land,  
A lesson to the reptile band,  
Who preferred to be quite dumb,  
With their smaller cerebrum.

And a precept let this be,  
For higher creatures such as we,  
Those well fit for better stations  
Are, 'mong human variations,  
Those who rightly have the claim,  
To a better working brain.

# THE BIOLOGIST

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## REPORT OF THE MEETING OF THE NATIONAL COUNCIL OF PHI SIGMA

The National Council of Phi Sigma met at Norman, Oklahoma, January 2 and 3, 1930 to consider several important matters which had come up since the last Convention (New York). All members of the Council were present for all meetings.

Some of the business discussed is already known by the chapters as immediate action was considered advisable and chapters have been notified by letter and asked to vote. These matters are:

I. The proposed change in the Constitution, Article IV, Section 4 and 5 to allow faculty and honorary members the right to vote if they choose to pay dues.

This seemed a very sensible change as at present these two classes of members, always of fundamental importance to any chapter, have no voice in the affairs of a chapter and hence often rightfully lose interest. It further seemed proper to leave the decision of paying dues to the individual, hence the word "choose".

II. Some chapters have been considerably embarrassed in the past and, in fact, some few are at present, by the failure of a few individuals (perfectly willing to accept the honor of election) to pay dues or to take proper cognizance of other equally important constitutional obligations.

A Chapter with such a delinquent member formerly had no power to act in its own behalf. If this amendment is passed each chapter will have this power, which in the opinion of your National Council is highly advisable.

At the same time the Council has constantly in mind the financial limitations under which a large number of students must work and is giving much thought to the problem of wise economy. It is believed



that no chapter will use the power of disciplining delinquents in an unjust way.

It is hoped that all chapter votes will be received soon so these proposed changes, if passed, may be put into operation.

It was decided that another Convention would be held next Christmas time in Cleveland, Ohio, with the American Association for the Advancement of Science as this is in accord with Article II, Section 4 of the Constitution. This action was taken due to the fact that not enough votes have been recorded to settle the matter of change in convention interval upon which all chapters were asked to vote some months ago.

Approval was voted on the proposal to have men prominent in biological research give lectures to the chapters of Phi Sigma if this could be arranged, and if these speakers could arrange itineraries including a group of from four to six chapters located within a reasonable distance of one another. The proposition was deemed quite possible. The matter of financing the proposal was also discussed but no definite action was taken.

The approval and commendation of the work of the former National Secretary, Dr. C. I. Reed was voted and a letter sent him. Doctor Reed very kindly consented some time ago to be chairman of a committee which is working on the problem of a Phi Sigma fund to be used as grants for research for students. It is hoped that we may be able to make an important and interesting announcement regarding this important matter in the near future.

Action has been begun to have Phi Sigma Society incorporated and also following this incorporation to have the name Phi Sigma Society as well as the key design registered in the United States Patent office. This has become quite necessary as a matter of ordinary protection.

It was decided to accept additional advertising in the BIOLOGIST to help defray expenses of publication. The first results of this work may be seen in this issue.

Chapters now inactive will be listed in the future in the Chapter Directory but indicated as inactive.

Chapters were requested to send in to the National Secretary's office a list of all honorary members of the chapter who do not regularly receive their copies of the BIOLOGIST. Such copies will be mailed to these valuable members directly. If your chapter has not done this please do so at once.



Plans were made for the installation of two new chapters. Alpha Zeta is to be installed by the National Secretary and others at the College of William and Mary, April 19, 1930. Alpha Eta, the Oklahoma A. and M. College at Stillwater, Oklahoma, is to be installed March 13, 1930 by Dr. A. Richards (Omega).

It is further planned that the National Secretary will visit several chapters en route to and from Williamsburg, Virginia.

An additional change to the Constitution was thought very advisable by your Council, in regard to the national officers. This has been explained in the letter of January 7, 1930 which was sent all chapters. Briefly, the time has come when Phi Sigma could very profitably have an honorary head or president. This office however is to be understood as purely honorary and therefore the functioning of the present national officers will in no way be altered. It is merely necessary to change the titles or names of the present President, and Vice-President to Chancellor\* and Vice-Chancellor respectively. We hope that all chapters will let this office have their vote shortly so that plans may materialize.

The final day and evening were spent in a very important and profitable discussion and consideration of the new ritual which has had the attention of Dr. A. M. Keefe, National Vice-President for some time. Doctor Keefe was appointed Chairman of a Ritual Committee by the 1925 Convention which met at Kansas City. The first rough draft of the new ceremony was presented at the Philadelphia sessions. The matter was there referred back to the committee chairman to await receipt by him of ritual modifications that had developed in the various chapters. For the four years following this meeting more pressing business matters forced the development of the ritual into the background.

However, the New York Convention of 1928-29, authorized the National Council to complete the preparation and to proceed with the adoption of the new ritual.

The present National Council acting under this authority has therefore jointly prepared the 1930 ritual of Phi Sigma.

It is not the purpose of the National Council to limit the use of any *informal* rites that may be practiced, but only to require that these *local* rites be preliminary to, and distinct from the formal initiatory ceremony or ritual. This allows a maximum of local chapter liberty, a condition

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\* See note on page 98.

always to be desired. No real or even apparent divergence from the initiation *proper* however will result.

The completed new ritual is to be used for the first time at the installation of Alpha Eta at Stillwater.

It has been necessary to divide the ritual into three sections, for obvious reasons: (a) an initiation service (b) an inauguration ceremony for new chapter officers, and (c) an installation ceremony for new chapters.

The National Council hopes to have the ritual completed, printed, and distributed to chapter presidents shortly.

The above brief discussion of the more important business transacted constitutes the official report of the 1929-30 meeting of the National Council.

A. I. ORTENBURGER,  
National Secretary.



## CONCERNING JOBS\*

The most powerful aid any graduate student seeking an appointment can have is the simple statement, "I can recommend this person without reservation or qualification." This is only good when it comes from a teacher who has been scrupulous *never* to overstate himself on a recommendation. One slip on the part of a teacher in this respect costs him the power of placing students in reputable positions thenceforth.

It is well therefore to bear in mind these facts. Strong recommendations can only be given when abundantly deserved in fairness to the department and its future students. Natural abilities and breadth of biological training are important, as are skill and personality, but most institutions look back of these things for certain unpicturesque but very essential phases of character. The capacity for independent, sustained, faithful, and effective work in your field is a first requisite. The proof of this capacity comes in the quiet certainty with which your tasks as a graduate student are carried through to genuine completion. Your strongest insurance is a record for absolute reliability in small matters as well as large ones.

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\*The above two paragraphs are kept posted on the bulletin board of the graduate laboratory of one of the larger state universities. It is thought that all students might very well consider the importance of its counsel.

# CHAPTER REPORTS

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The following lists should speak for themselves.

Chapter reports for both this issue of the BIOLOGIST as well as the last (XI, No. 2) have been received from the following chapters and these chapters are to be commended.

*Beta* (University of Michigan)

*Mu* (University of California)

*Xi* (University of Nebraska)

*Rho* (University of Illinois)

*Phi* (University of New Hampshire)

*Chi* (Montana State College)

*Omega* (University of Oklahoma)

*Alpha Alpha* (University of Southern California)

*Alpha Epsilon* (University of Pittsburgh)

The chapters in the list given below have had a report in either No. 2 or No. 3 of this year.

*Epsilon* (University of Denver)

*Eta* (University of Akron)

*Iota* (Washington University)

*Lambda* (University of Montana)

*Nu* (Washington and Jefferson College)

*Upsilon* (Miami University)

*Psi* (University of Washington)

*Alpha Beta* (Mount Union College)

*Alpha Gamma* (University of South Dakota)

*Tau* (Duke University)

The list printed below is of those chapters which have failed to send in any report this year. Such apparent lack of interest and inaction is not typical of Phi Sigma.

*Delta* (University of Maine)

*Zeta* (University of Wisconsin)

*Theta* (Michigan State College)

*Kappa* (University of Kansas)

*Pi* (Emory University)

*Sigma* (University of Florida)

*Alpha Delta* (Lawrence College)

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## BETA

### University of Michigan

The following list of honorary, faculty, and active members of Beta Chapter with the fields of their respective research constitutes the chapter report for this issue of the BIOLOGIST. It is thought that such a



list of our members with their many diverse problems would be of interest to other members of Phi Sigma.

#### HONORARY MEMBERS:

- Prof. E. C. Case: Paleontology; Osteology and Morphology of Extinct Reptiles.  
 Prof. G. Carl Huber: Anatomy; Development and Morphology of Uriniferous Tubules in Mammals. Anatomy, Regeneration, and Degeneration of Nerve Tissue.  
 Dr. F. G. Novy: Bacteriology, Physiological Chemistry; Chemistry of Bacteria. Anaphylaxis. Microbic Respiration. Cultivation of Trypanosomes. Etiology of Diphtheria, Yellow Fever and Plague.  
 Prof. A. F. Shull: Genetics; Life Cycles in Rotifers, Aphids and *Thrips*. Sex Determination and Heredity in Rotifers and Insects.

#### FACULTY MEMBERS:

- Dr. C. A. Arnold: Paleobotany; Investigations of the Petrified Wood of Southern Indiana. Carboniferous Flora of Michigan.  
 Prof. H. H. Bartlett: Genetics, Systematic Botany; Genetics of *Oenothera*. Flora of North Sumatra.  
 Prof. B. M. Davis: Cytology; Genetics and Cytology of *Oenothera*.  
 Prof. Wilfred T. Dempster: Comparative Anatomy; The Anatomy of the Inner Ear. Identification of Cranial Pits of Fossil Reptiles. Life History and Development in *Ambystoma*.  
 Dr. Lee R. Dice: Mammalogy; Biogeography of Species of *Peromyscus*. Systematics of the *Lagomorpha* and of the Michigan Mammals.  
 Prof. J. H. Ehlers: Systematic Botany; Study of Flora of Douglas Lake Region. Study of Flora of Dunes of Northern Michigan.  
 C. O. Erlanson: Plant Geography; Arctic-Alpine Distribution of Species.  
 Prof. F. M. Gage: Entomology; Systematics of the *Formicidae*. Ecology and Zoögeography of the *Formicidae*.  
 Mrs. H. T. Gage: Herpetology; Systematics and Zoögeography of Amphibians.  
 Prof. Robert Gesell: Physiology; Cardiodynamics. Relation of Blood Volume to Tissue Nutrition. The Chemical Regulation of Circulation.  
 Prof. F. G. Gustafson: Plant Physiology; Respiration of Tomato Fruits.  
 William P. Harris Jr.: Mammalogy; Systematics and Zoögeography of the *Sciuridae*.  
 Dr. W. B. Hinsdale: Archaeology; Archaeology and Anthropology of the Great Lakes Region.  
 Prof. Carl L. Hubbs: Ichthyology; Taxonomy, Distribution, Ecology, Variations and Life Histories of Fishes.  
 Prof. C. D. La Rue: Physiological Plant Anatomy; Intumescences on Leaves. Regeneration of Tissue Culture in Plants.  
 Prof. G. R. La Rue: Parasitology; Taxonomy and Life History of Parasitic Worms, Especially the *Strigeidae*. Parasites of Michigan Deer.  
 Prof. Peter Okkelberg: Embryology; Cytology, Fertilization, and Development of Germ Cells. Life History Studies of the Brook Lamprey.  
 Prof. John F. Shepard: Psychology; Learning Processes. Studies of Instincts.  
 Prof. Paul S. Welch: Limnology and Aquatic Entomology; Limnological Studies of Michigan Lakes. Respiration of Aquatic Insects.

- Dr. L. Wehmeyer: Mycology; Monograph of the Genus *Diaporthe*.  
 Prof. Arthur E. Woodhead: Parasitology; Life Histories of Bucephalid Trematode Parasites. Microphotography.  
 Prof. L. J. Young: Silviculture; Effect of Oak Cover on Pine Plantations. Selection Cuttings in Mixed Hardwoods. Effect of Black Locust on Growth of Black Walnut. Comparative Effect of Growth of Spruce and Pine on Poor Spruce Sites.  
 Prof. D. V. Baxter: Silvics and Forest Pathology; The Deterioration of Chestnut in the Southern Appalachians; The Control of Stains in Stave Timber; The Durability of White Cedar with Reference to Sites in Michigan.

## ACTIVE MEMBERS:

- Donald J. Ameel: Parasitology; Life History of the Parasites of the Muskrat.  
 Nelly Bosma: Parasitology; Life History Studies of Cestode Parasites.  
 Robert Bradley: Mammalogy; Distribution of the *Sciuridae*; Age Factors in Skeletal Changes.  
 Wesley Clanton: Herpetology; Life History of *Ambystoma jeffersonianum*.  
 Inez Clark: Paleobotany; Study of Coal Balls.  
 Edwin P. Creaser: Carcinology; Taxonomy, Life Histories and Variation of the North American Species of *Phyllopoda*; Systematics and Zoögeography of the Crayfishes.  
 Hilary J. Deason: Ichthyology; Systematics and Life Histories of the North American Species of *Stizostedion*.  
 Evelyn Dressel: Micropaleobotany; Pollen-analytical Study of American Peat Deposits.  
 Wilbur C. Gorham: Limnology; Limnological Studies of Northern Michigan Acid Lakes.  
 Kenneth L. Jones: Genetics; Cytology and Genetics of *Ambrosia artemisiifolia* and *Ambrosia trifida*. Genetics of *Phora*.  
 Kimber Kuster: Entomology; Respiration of Aquatic Dipterous Larvae.  
 Marina L. Langlois: Embryology; Spermatogenesis in Mice.  
 Donald E. Miller: Limnology; Seasonal Migration of Species of *Hydra*; Systematics of the Species of *Hydra*.  
 Newall A. Norton: Wood Technology; Preliminary Investigation of Mechanical and Physical Properties of Certain Tropical Timbers.  
 Marcus Old: Ecology; Ecology, Systematics, Morphology, and Life History of Freshwater Sponges.  
 George M. Plagens: Embryology; Spermatogenesis and Oögenesis in Species of *Peromyscus*.  
 Helen F. Price: Parasitology; Life Histories of Schistosome Parasites of Small Mammals.  
 Ruth Richardson: Bacteriology; Streptococcus in Root Canal Infections.  
 Paul Risley: Embryology; Embryology and Spermatogenesis of the Musk Turtle, *Sternotherus odoratus*.  
 Alden Roe: Bacteriology; Respiration in Anaerobic Bacteria.  
 Clayton W. Scribner: Forest Management; A Management Plan for a Lodgepole Pine Working Circle on the Manti National Forest.

J. K. Gwynn Silvey: Entomology; Life History of the Burrowing Insects of Lake Shores.

Esther Whitney: Embryology; Life Cycles of Mollusks.

EVELYN DRESSEL

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## MU

### University of California

Following the trend of the discussion started by Prof. W. A. Setchell at the first dinner meeting of this semester, when he spoke on some problems of the South Pacific, Prof. E. B. Babcock of the Department of Genetics, College of Agriculture, told us something of "The How of Evolution". His talk, based on the recent work of Dr. Lillian Hollingshead and himself on the chromosome numbers in species of *Crepis*, informed us of the behavior of chromosomes and how one species with a different chromatin make-up was or might be derived from certain central types.

At the succeeding gathering, Prof. Alan A. Boyden, visiting professor from Rutgers this year, spoke regarding the physiological factors involved in evolution, reviewing briefly the field and significance of blood groups and discussing the use and value of precipitin tests in determining the degree of animal relationships.

#### DEPARTMENT OF BIOCHEMISTRY:

Dr. C. L. A. Schmidt is still determining dissociation constants of various amino acids. The report of his latest completed investigation appeared in the *Journal of Biological Chemistry*, Dec. 1929 under the title "The Apparent Dissociation Constants of Tryptophane and of Histidine."

Mr. C. V. Smythe is working on a problem in protein chemistry for his Ph.D. He is trying to determine the type of compound that iron forms with proteins and related substances.

Dr. David M. Greenberg received a Guggenheim fellowship to the University of Cambridge, England and is now on a year's leave of absence. He is working with Professor Barcroft in Physiology on hemoglobin. Doctor Greenberg was asked to give a paper before a Biochemistry seminar meeting at Cambridge on "The Osmotic Pressure of Hemoglobin in Urea Solutions." He had the honor of being present at a meeting of the staff of biochemists when Dr. F. G. Hopkins was awarded the Nobel prize.

Mr. J. D. Greaves is beginning work on the relation of bile to osteoporosis as a problem for his doctor's thesis.

Mr. George Giragossintz is interested in a number of problems. For his master's degree he has been studying with Dr. E. S. Sundstroem on the effect of low atmospheric pressures on normal and on cancerous rats. He has been doing some work in the Department of Physiology on the factors to be observed



in freezing tissues in liquid air. He has also been comparing the effect of adrenalin when injected subcutaneously and when given by mouth; and has investigated the effect of amytal on blood sugar curves.

Miss Helene G. Kirby is a senior this year and will graduate in May. She has majored in biochemistry and is especially interested in the fields of immunology and bacteriology.

Miss Ethel F. Curry is working on a problem in nutrition: to determine if an alkaline diet has any effect on lactation in rats.

#### DEPARTMENT OF HORTICULTURE:

Dr. J. P. Bennett is engaged in a study of chlorosis, involving a chemical analysis of chlorotic pear trees and the soil on which they are grown. Different chemicals are applied in various ways to orchards to find the best cure for the disease.

Dr. S. H. Cameron who returned from England last November where he had been working on an International Educational Fellowship, with Dr. J. H. Priestley on cambial activity of fruit trees, is now studying the varieties of dates, their quality, adaptability, and yield. The seasonal variations in carbohydrates in citrus fruits is also under investigation.

Dr. W. H. Chandler is interested in the following problems: Little leaf—its cause and cure; the actual causes of death in killing of plant tissues by freezing; relation of leaf area to dry weight produced by fruiting and non-fruited trees with special regard to the apple, peach, and apricot.

Prof. R. W. Hodson is making a field study supplemented by plot experiments on persimmon, avocado, and walnut varieties to determine the most suitable cultural practices.

B. S. Bajwa is making a study of carbohydrates in citrus fruits during their development.

A. S. Crafts is making a physiological study of movement of organic materials in plants.

J. F. Crawford is studying the correlation of total nitrogen to living material in pear shoots.

A. S. Mulay is studying the nitrogen metabolism in the Bartlett pear.

#### DEPARTMENT OF FORESTRY:

Teh-i Li is working on "Some Phases of the Moisture Conservation of the Forest". He received his B.S. degree at the University of Nanking, China, in 1923. Later he became an instructor in the Department of Forestry there, and was acting head of the department from 1928 until he came here to study. His publications are: "Forest Cover and Floods on the Hwai River Region"; "Vegetative cover and Run-off Conditions of Shansi, China"; and "Report of Forest Survey of Kiangsu Province".

Eldred R. Ware, Colorado Agricultural College, '24, is working on the "Effect of High Temperature upon the Germination of Seed of certain Chaparral Species". This study should explain some of the responses of chaparral to fire.

John R. Neetzel, Minnesota, '29, is working on "The Root development of Western Yellow Pine in Relation to the Distribution of Water in the Soil". Moisture levels are maintained at definite depths for 90 days and the correspond-

ing root development studied, the soil being kept at normal moisture capacity throughout the experiment.

Lloyd W. Swift is studying "Some Factors Delimiting Brush and Grass Types in a Restricted Locality". The study is concerned with measurement and correlation of site factors with plant responses in the types.

#### DEPARTMENT OF ZOÖLOGY:

Dr. Ena A. Allen recently accepted the position of assistant zoölogist in the Bureau of Animal Industry, U. S. Department of Agriculture at Washington.

Blondel Carleton is continuing his studies on the passage of respiratory catalysts into living cells.

Frank H. Connell is working on the morphology of flagellate protozoa parasitic in the gut of *Neotermes simplicicornis* a sound wood termite found chiefly in desert regions.

Gordon B. Castle, assistant biologist with the Termite Investigation Committee, has a paper nearing completion on "A Redescription of *Reticulitermes hesperus* and *R. tibialis*", which are two of the important species of this genus found in California.

David M. De Forest, who recently completed his doctor's thesis on the effect of X-rays on the pupae of *Drosophila*, has joined the staff of the Biology Department of the University of Tennessee.

Ethel McNeil has undertaken the study of the encystment and pure culture methods of the human protozoa.

Herbert Johnstone is investigating further some phases of the work on the amoebae involved in pyorrhea.

R. F. MacLennan is preparing a study of the parasitic ciliates found in the stomachs of ruminants.

Mary M. Erickson is investigating the status of the intermediate wren tit, (a bird of somewhat uncertain systematic position) with notes on its natural history.

Gertrude M. Smith is delving into the problem of the nature of Jacobson's organ in terrestrial amphibians.

Carroll F. Neff, a member from the chapter at Washington University, St. Louis, is studying experimental therapy in avian coccidiosis in connection with this and the Department of Veterinary Science on this campus.

J. C. Henderson is looking into the question of the genetic relationships of amphibian leucocytes.

MARY F. SANFORD.

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## NU

### Washington and Jefferson College

Nu Chapter started its new year by electing the following officers to lead them: R. R. Bushyager—President, M. W. Helfrick—Secretary, and F. W. Callahan—Scribe. All of these men are members of the senior class.

There were eleven members back to carry on the work of Phi Sigma and the first important business carried out was to establish a weekly meeting, instead of the bi-monthly as was formerly the custom. This step was taken to maintain a greater interest in biological affairs. So far the plan has been a success. It was also decided that one paper dealing with biological affairs was to be presented by a member at each meeting. In this manner the Chapter can keep in touch with affairs of the biological world.

At the meeting held November 19, short talks were given by old members on the following topics: Effects of transplanting sex glands, maternal mortality, the pituitary gland, effects of over secretion and under secretion, and the raising of parasites in the living chick as carried out by Hegner at Johns Hopkins University.

On January 8 Nu Chapter started the new year by holding their annual open meeting for pre-medical students. This took place in the lecture room of the Washington Hospital and was in the form of a lecture by Doctor Reubens, noted urologist.

Doctor Reubens lectured for two hours before an attentive audience on the kidney and uro-genital tract. He discussed the embryology and morphology of the kidney, illustrating with drawings and manikins. He also discussed various diseases of the kidney, illustrating with X-rays and human kidneys. He closed his talk by illustrating the means of diagnosis, showing instruments and demonstrating their use.

This was one of the best meetings that Nu Chapter has had and many thanks were received from other pre-medics showing their appreciation of having such an opportunity presented to them by Phi Sigma.

F. W. CALLAHAN.

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## XI

### University of Nebraska

With the taking in of twenty-three new members at the winter initiation banquet, Xi Chapter has practically doubled its active membership. The new student members include: Henry Beachell, George Bennett, E. N. Bressman, H. J. Cottle, John Darrah, Wilber Deacon, Emil Fiala, Edson Fichter, Elvin Frolik, C. L. Jorgensen, Brigitta Koerting, Anna Lallman, W. E. McQuilkin, Donald Rogers, Mary Rogick, Orvel Vogel, Dorothy Weiner and Marion Williams. Initiates from the faculty were: R. A. Lyman, chairman of the Physiology Department; Charles L. Wible, of the Physiology Department; F. D. Keim,



of the Agronomy Department; T. A. Kisselbach, of the Agronomy Department; and R. W. Goss of the Plant Pathology Department.

Our recent meetings have featured talks by students and faculty members or outside persons. Dr. Lugn of the Geology Department, gave an exceedingly interesting address with illustrations, on the Pleistocene Geology of North America, with particular reference to Nebraska and Iowa.

The following are the research problems of some of the members: H. J. Cottle—Plant ecology: Alpine Texas Range Management, Factors affecting Vegetational Distribution. W. E. Deacon—Parasitology: Studies of two new Cestodes *Oochoristica* from the skunk.

Protozoology: Some studies on the Bacteriology of the Oral Cavity.

Myrel Burk—Taxonomy: Flowering plants of Black Hawk County, Iowa.

Marion Williams—Morphology: Development of embryo of *Kochia scoparia*.

J. R. Darrah—Parasitology: Cestodes.

Mary D. Rogick—Zoölogy: Histology of the digestive tract of a fish, *Campostoma anomalum*.

Frieda Roerden—Ecology: Plasticity of the root system of some swamp plants grown under saturated non-aerated, saturated-aerated, good tilth, and air dry conditions.

George A. Herzog—Zoölogy: Research on life history of *Chlamydomonas*.

A review of the nematode parasites of the mammals of Nebraska with descriptions of two new species.

R. H. Nelson—Entomology: Determination of the place of hibernation of the codling moth larva (*Carpocapsa pomonella* Linné) under Nebraska cultural and soil conditions. The problem includes the possibility of winter control by banding and orchard sanitation.

ELIZABETH PINKERTON.

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## RHO

### University of Illinois

The members of Rho Chapter are this year investigating many different problems. A report follows for those members concerning whose research activities information could be obtained.

## FACULTY MEMBERS:

Two of our faculty members are on leave of absence. Dr. Elmer Roberts is at Tunghsien, Peiping, China, where he is continuing his work on genetics with special reference to the inheritance of resistance to bacillary white diarrhea in chickens.

Doctor Baldof, also on leave of absence is continuing his study of minute parasitic wasps in the control of destructive insects.

In the Department of Botany, Dr. A. R. Kienholz is carrying on several pieces of research work: (1) The occurrence and structure of compression wood in mountain hemlock. (2) The effect of environmental conditions on the structure of the wood of the lodgepole pine. (3) The vegetation of comparatively recent lava beds in the Pacific Northwest. (4) The growth rates of trees planted on black prairie soil in Illinois in relation to environmental conditions and in comparison with trees planted on yellow forest soils.

The following studies in crop production are being undertaken by Dr. J. J. Pieper: (1) Clovers for hay and seed production. (2) Effect of cold storage of seed potatoes on production of the crop. (3) Forage crop investigations. (4) Weed eradication.

In nutrition, Dr. Rossleene A. Hetler is carrying out the following projects: (1) A study of the vitamin B and G content of cereals (2) A study of the vitamin B and G requirement of lactation. (3) The effect of high protein diet on growth, reproduction, lactation, and the condition of the kidney in the rat.

Dr. H. J. Van Cleave is coauthor of "A Manual of Biological Principles in General Zoölogy," now in press, and is preparing "A Monograph of the *Acanthocephala*."

## ACTIVE MEMBERS—AGRICULTURE:

In animal pathology, Dr. Frank Thorp, Jr., is studying Avian Infectious Laryngo-trachitis, Rabies in dogs, Botulism in domestic animals, and Infectious Abortion in domestic animals.

In crop production, Mr. R. L. Matlock is investigating the effects of artificially induced, below freezing temperatures on dent corn at varying degrees of maturity as measured by the moisture content of individual ears.

The nutritional properties of milk with special reference to the supplementary value of inorganic constituents is the study that is being carried on by Mr. D. D. Shaw, of the Dairy Department.

Mr. L. C. Thomas, in the Department of Animal Genetics, is investigating the relation between the age of sexual maturity and fertility in the white rat.

In olericulture, Dr. W. H. Michaels is making a physiological investigation on sweet corn.

## BACTERIOLOGY:

Hydrogen sulphide production by Thermophiles is under investigation by Mr. F. M. Clark.

Miss Florence Evans is studying the effect of chlorides, nitrates and nitrites on the growth and toxin production of putrefactive anaerobes.

## BOTANY:

Available water and wilting of plants is the problem on which Mr. A. D. Moinat is working, and Mr. G. M. Shear is making starvation studies of plants with special reference to the peanut and bean.

Miss Charlotte Liebttag lists her research problems as follows: (1) Root aeration and its effect upon plant growth. (2) Morphologic study of petals of cultivated plants, with special reference to the keeping quality of cut flowers.

## NUTRITION:

Mrs. Clara R. Meyer and Miss Dorothy Hussemann are investigating the vitamin B and G content of wheat, corn, and oats. Mrs. Meyer and Miss Margaret Plant are studying the vitamin B and G requirements for lactation in the rat. Mrs. Meyer is also investigating the relation of the protein level in the diet to the vitamin A requirement of the rat. A study of the variations in the basal metabolism of university women is being made by Miss Plant.

A study of the dietary habits of university home economics students is the problem on which Miss Lillie Johnson is working.

## PHYSIOLOGY:

Mr. D. J. Verda lists the following research work, which he is carrying on in conjunction with other members of the department: (1) Proof that the irradiation of a sugar solution greatly increases the ease with which it is used. (2) A correlative study of the anesthetizing power and surface tension of methyl, ethyl, *n*-propyl, *n*-butyl, *n*-amyl and caprylic alcohols. (3) To determine whether the structure of all possible isomers of *n*-propyl, *n*-butyl, and *n*-amyl alcohols has any change on their anesthetizing powers. (4) Research in regard to color blindness.

## ZOÖLOGY:

A study of normal and pathological variations as found in the Illinois mound-builder Indian skeleton is the research which Mr. W. F. Hoheisel is carrying on.

MARGARET L. PLANT.

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PHI

## University of New Hampshire

The following is a brief report of the research being carried on by active and faculty members of Phi Chapter of Phi Sigma.

Philip F. Allan—The major part of Mr. Allan's work this year is on the ecology of the birds at the Isles of Shoals. This consists mainly of a study of the migratory and food habits of the birds in this locality. A check-list is being prepared in conjunction with this problem. He is also working on an experiment in the re-colonization of the Common tern (*Sterna hirundo*) and hopes to have some positive results this coming summer.

Mr. Allan is also assisting in work on the ecology of the mammals of New Hampshire.



Gerald Bagley—Studies in the effects of different kinds of soils on the growth of shrubs.

Dorothy S. Barton—Mrs. Barton is working on the ecology of the sponges of Friday Harbor region, Puget Sound.

Charles Bottorff—Doctor Bottorff is working with Doctor Martin on a project, "Skin vaccination of Fowl Pox". A bulletin covering this experiment was recently published by the Experiment Station of the University. Another problem Doctor Bottorff is working on is "The Transmission of Pullorum Disease (bacillary white diarrhea) in Growing Chicks on the Range". The big factors to be determined are the rate of spread and at what period the spread is the greatest among birds on the range. It is necessary to determine the above factors before a definite recommendation can be made as to what age is the best time to test in order to clean up an affected flock. This work will be carried on another year in order to check the results of the past season.

Joseph Bourque—Mr. Bourque is working on a detailed dissection and study of the vascular system of *Amphiuma means* and a comparison of this with the blood systems of other Urodeles.

Jean Brierley—Miss Brierley is working on a problem in experimental embryology. She is observing the changes occurring as a result of altering environmental conditions, particularly temperature, immediately after artificial fertilization of starfish.

Kenneth Butterfield—Mr. Butterfield is determining the hydrogen ion concentration of the autumnal colored leaves of the more important forest trees in Durham, N. H.

Arthur Collins—Studies in root growth and form of young tree species of southern New Hampshire pastures.

Roland B. Dearborn—Effect of Pruning upon the Growth and Composition of McIntosh Apple Trees.

Leon C. Glover—An experiment in the rearing of mosquito larvae throughout the winter months. A study of the ecological conditions necessary and determining whether female mosquitoes feed and lay eggs more than once. Also—The role of surface activity and related factors in the performance of contact insecticides. This includes toxicity studies on several insects and penetration into trachea of two insects.

Alma D. Jackson—Mrs. Jackson is studying the early stages of development of the gulls and terns at the Isles of Shoals.

C. F. Jackson—Professor Jackson is working on the ecology of the mammals of New Hampshire.

L. P. Latimer—Doctor Latimer is investigating several problems. One deals with the pollination of apples in New England. Under this project they were able last year to determine a close correlation between temperature at or closely following time of pollination and set of fruit.

A second project dealing with the cold storage of Baldwin apples has this year given additional evidence that carefully controlled cold storage is a superior method of keeping New England grown apples than is common storage where low temperature is maintained by use of cold air from outdoors.

A problem of the fertilizer requirements for strawberries, has given results this year to further substantiate the idea that in New England nitrogen fertil-

izers do not increase the strawberry crop but may actually cause a decrease unless applied in sparing amounts when there seemed to be some increase.

Philip R. Lowry—A Study of the Effects of Certain Organic Acids on Mosquito Larvae; A Study of the *Acadellidae* of New Hampshire; Control of Mosquitoes along the New Hampshire Sea Coast.

C. L. Martin—Doctor Martin is working on three different projects: Poultry Paralysis; Fowl Pox; and Contagious Abortion in Cattle.

The poultry paralysis project consists of running blood counts of normal and paralytic birds to see if there is any particular derangement in the constituents of the blood of the respective birds.

The fowl pox project includes experimental work on different methods of vaccination as well as a course of experiments to determine how long a bird will remain immune following vaccination.

The work on contagious abortion consists of blood testing several herds for the presence of this disease, by means of the agglutination test. Following this testing the plan of isolation of the reactors is followed with the idea of maintaining a negative and positive herd.

Eleanor L. Sheehan—The Effect of anterior lobe of pituitary on the offspring of albino rats when administered to the parent.

John F. Sheehan—Histological studies on the eyes and optical mechanism of the shrew *Blarina brevicauda*.

Charlotte Smith—Histological studies on the effect of rapid change from salt to fresh water on the tissues of *Fundulus heteroclitis*.

Clark L. Stevens—Studies of the Growth of Roots of White Pine (*Pinus strobus* L.)

Ruth E. Thompson—Ecological studies on the tidepools of the Isles of Shoals.

Marjorie M. West—Life History, Anatomy, and Embryology of the Herring Gull.

George W. White—Stratigraphy of the Mississippian and Pennsylvanian of Holmes County, Ohio.

RUTH E. THOMPSON.

## CHI

### Montana State College

Research work of active and faculty members of Chi Chapter of Phi Sigma is given below.

#### FACULTY:

Dr. F. B. Cotner is continuing to investigate the formation and cytology of zoospores as they occur in various species of the lower fungi.

Dr. J. R. Parker will assume his new position with the Bureau of Entomology as Senior Entomologist in Charge of Grasshopper Control.

Professor R. A. Cooley who is head of the Department of Entomology is doing considerable work on the Tick Parasite.

Allen Mail is working on Mosquito Control.

Dr. W. C. Cook besides working on cut worms is a co-worker with H. H. Morris on the Abandoned Land Project at Three Forks, Montana.

Professor M. H. Spaulding of the Zoölogy Department is particularly interested in the Embryology of the Ground Squirrel.

H. E. Morris is the head of the Botany and Bacteriology Department of the Montana Experiment Station, Extension Botanist for the Montana Extension Division, and Collaborator with the United States Department of Agriculture. The time allotment is one half to the Experiment Station, one fourth to the Extension Division and one fourth to the United States Department of Agriculture.

The active projects of the experiment station are as follows:

1. Miscellaneous Plant Diseases (State Fund).
- \*2. Degeneration Diseases of Potatoes (Adams Fund).
- \*3. Injurious Effects of Oil Sprays (Purnell Fund).
4. Blight and Root rots of the pea (Adams Fund).
5. Blight and Mosaic disease of the bean (Adams Fund).
- \*6. Date of Seeding and Method of treating Seed Wheat to Control Smut (Purnell Fund).
- \*7. Influence of Plant Food on Apple Trees (Purnell Fund).
- \*8. Plant Succession in relation to insects on abandoned land (Purnell Fund).
- \*9. Breeding Great Northern Beans for varieties resistant to Blight, Rust and Mosaic Disease (Purnell Fund).

In Coöperation with the United States Department of Agriculture the following projects are active:

1. Oat Blast Studies.
2. Uniform Rust Nursery.
3. Plant Disease Survey of Montana.
4. The Barberry Eradication Campaign.

#### ACTIVE MEMBERS:

These are all thesis problems.

Lois Cobleigh and Genevive Gamble—Bacterial Flora of Normal and Abnormal Throats.

James Copeland—A New Fungus Disease of Lettuce.

Joe Delaney—The Myology of *Cynomys ludovicianus*.

Virginia Mills—Bacterial Flora of the College Swimming Pool.

Fred Morton—Study of the Thermal Constants of *Ixodiphagus cancurtei*.

John Ashworth Thompson—Biology of *Streptococcus lactis*. (This member was recently pledged and will be initiated soon.)

Chi Chapter has increased its membership since the beginning of the Fall Quarter. The pledges who will be initiated during this quarter

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\* These projects are in cooperation with some other department of the Experiment Station.



are: Mildred Porter, a transfer from the University of North Dakota and Gail Fiske Avery both Juniors in the botany and bacteriology department. Charles Johnson also a botany and bacteriology student, John Ashworth Thompson a graduate student in this department and Richard Bruner a Junior of the Applied Science Department.

VIRGINIA MILLS.

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## OMEGA

### University of Oklahoma

#### FACULTY MEMBERS:

Dr. A. Richards, head of the Department of Zoölogy, has his textbook, "Outlines of Comparative Embryology," nearly completed and hopes to have it ready for use next fall. During his recent stay in Naples, Italy, he worked on the "Structure of the Chromosomes in *Drosophila*, particularly in the Spireme Stages." He coöperated with his wife, Dr. Mildred Hoge Richards, on the "Specificity of Fertilization in *Ciona* and *Phallusia* (Ascidians)." Mrs. Richards is experimenting on the "Effect of Low Temperatures on the Mutability of the Strain of *Drosophila* var. *beadex*." She is also collecting more data on hay fever irritability with Dr. Ray Balyeat.

Dr. Paul B. Sears has in press (*Botanical Gazette*) a "Key to the Pollens of Post-glacial Peats." He hopes to have finished other work on pollen analyses by spring.

Dr. A. O. Weese, following intensive collecting in the Wichita Mountains, is studying the "Relations of Animal Communities to Overgrazing." He is, in addition, working on the "Distribution of Animals on the Sea Bottom," basing his information on data taken at Friday Harbor, Washington.

A continuation of the "Revision of the Genus *Heterodon* (Hognose Snakes)" has been occupying the time of Dr. A. I. Ortenburger when he is not busy getting out the new BIOLOGIST.

"A Preliminary List of the Ferns and Seed Plants of Oklahoma" is now in press as the result of the efforts of Dr. R. E. Jeffs. This will appear as one of the publications of the Oklahoma Biological Survey.

By summer, Dr. Adriance S. Foster hopes to complete his studies of the "Morphology and History of Development of Cataphylls and Foliage Leaves in Pignut Hickory (*Hicoria glabra*)."

Professor Dixie Young is interested in the general problem of conjugation in *Paramecium*. Fission rates are recorded and a cytological

study made of the cells to determine if there are any nuclear changes which may be correlated with changes in fission rate.

The collection and identification of Oklahoma dragon flies has been started by Dr. R. D. Bird, who is also working over the summer insect and bird collection of the Oklahoma Biological Survey, and having the specimens identified by specialists. "Biotic Communities of the Aspen Parkland of Central Canada," his doctor's thesis, is now in press (*Ecology*).

In coöperation with the State Fish and Game Commission, the food of the Bobwhite is being studied by Doctor Bird and Lois Gould Bird. An examination is being made of the crop contents of over a hundred specimens from widely scattered parts of the State. A collection of seeds is being made in connection with this problem.

In addition to general plant chemistry problems done with graduate students, Doctor Lloyd Harris is working on an assay of *Ipomoea* and an assay for the quinine content of quinine preparations.

Dr. E. C. Angst (Psi Chapter) has already described 35 of Oklahoma's diatoms and figured more than twice as many. This is a beginning of a taxonomic study of the diatoms of the State. Mr. Glenn Couch, a pupil of Doctor Angst's, is also working along the same line.

Mr. Rufus Moore is continuing his observations on the "Anatomy of the Upper Epidermis of the Corn Leaf Blade, *Zea mays*."

#### ACTIVE MEMBERS:

Taxonomy of the desmids of Oklahoma is the problem with which Mr. Clarence Taft is working. In the less than five months that he has spent in the State he has found a hundred species representing ten genera. These will be worked into a key with descriptions and drawings of each.

The State Forestry Commission, headed by Mr. George Phillips, is working with the Botany Department on the coöperative problem of "Grazing and Fire with Relation to Reforestation in Southeastern Oklahoma."

Miss Celeste Whaley is concerning herself with the "Spermatogenesis of *Acris gryllus*."

Mr. Ray Porter is working on the "Mitotic Rate in the Development of *Fundulus heteroclitus*." This will be a correlation of the rate of cell division with embryonic growth in a teleost.

"The History of the Germ Cell of the Trout Embryo" will form the master's thesis of Mr. George Moore.

Miss Helen Vincent is working on the "Structure and Development of the Pollen Wall in *Oenothera serrulata*."

*Drosophila*, from the standpoint of both genetics and cytology, has kept two persons busy counting flies. Miss Mildred Groseurth is considering the "Relation of Age to Mutability in *Drosophila*," and Mr. John Shed, besides working on *Drosophila's* Chromosome Cycle, presented the "Genetics of a New Mutation in *Drosophila*" as his master's thesis.

Mr. Herbert Warfel has worked on the mitotic index of the honey bee larva during the first day after it hatches.

A local vegetational study is being planned by Mr. Charles Olmsted.

Miss Melita Fuentes is doing practical experimentation on "Auto-genous Vaccines."

Samples from six-inch levels of three bogs form the basis of the work Mr. George Lane is doing on the "Pollen Analyses of some Post-Wisconsin Peat Bogs of Northern Iowa." Mr. Lane is refining some of the methods developed last year by Miss Phyllis Draper in the work on her thesis on "Pollen Analyses of Post-Glacial Ohio Bogs."

Miss Percy Lee Welch studied the ecology of a piece of virgin prairie near Norman.

The Ground Beetles of Oklahoma and western Arkansas have formed the chief interest of Mr. Eugene B. Webster for several years. He hopes to present them in a taxonomic study for his thesis this spring.

Some five thousand spiders were collected from southern and eastern Oklahoma as a basis for a taxonomic study of the spiders of the State by Mr. N. M. Newport. This was done during June and July of 1928 and 1929 as part of the work of the Oklahoma Biological Survey.

LOIS GOULD BIRD.

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## ALPHA ALPHA

### University of Southern California

For the October meeting of Alpha Alpha Chapter we were particularly fortunate in obtaining Dr. B. M. Allen of the University of California at Los Angeles as our speaker. He spoke on "The Influence of the Thyroid Gland and the Hypophysis upon the Growth and Development of Amphibian Larvae." Doctor Allen has pursued this subject for a number of years in his research work, thus being able to give us much of interest in his technique and results.

Alpha Alpha Chapter at the December meeting received into membership the following:



Mrs. Tema Shults Clare, B.A., Teaching fellow Botany Department; Mr. George Hall Douglass, B.A., Student Medical School; Miss Ruth E. Eaton, M.A., Science teacher, Long Beach; Miss Dorothy B. Box, B.A., Graduate student in zoölogy; Miss Evelyn P. Kowitt, Senior student in biology; Mrs. Andrew C. Life, M.A., Science teacher, Los Angeles; Miss Elizabeth B. Stockford, B.A., Graduate student in zoölogy.

Three short addresses were given by members of the local chapter. Mr. Roy E. Campbell, Entomologist of the U. S. Dept. of Agriculture spoke on "Recent Work on Wire Worms." An illustrated lecture was given on "The Present Status of the Wild Life in California," by Mr. Harry L. Bauer of Long Beach. The third address was given by Mr. R. S. Denman of the Long Beach Junior College. He told of his study at Puget Sound Biological Station in Washington.

The January meeting was held in conjunction with the Faculty Science Club in the Trojan Grill. Dr. Frederick A. Leonard of the University of California at Los Angeles gave an illustrated lecture on "The Revelations of Modern Astronomy." This was the first of a series of joint meetings planned for the coming year where eminent men of science will speak to the Faculty Science Club and other organizations on the campus such as Phi Sigma.

The following is a short résumé of some of the research work being carried on by graduate members of Alpha Alpha Chapter:

Dr. B. M. Harrison and Miss N. Ellen Denning have recently published an article entitled "Embryonic Development of the Pharyngeal Region in *Thamnophis radix*," in the *Anatomical Record*, vol. 44, no. 2, Nov. 25, 1929. This included a discussion of the development of the pharyngeal pouches and their derivations, the respiratory anlage, the thyroid anlage, and the phenomena of the atresia of the esophagus and the stenosis of the larynx in the garter snake.

Miss Margaret Ann Yonge of Long Beach has been working on the problem, "The Regeneration and Redifferentiation of *Edwardsiella californica*." The object of her work was to obtain more knowledge regarding, first, the development of oral tentacles and aboral bulbs from pieces cut from all regions of the polyp, *Edwardsiella californica*; second, the period of endurance of repeated regenerations; third, the production of heteromorphic heads by lateral incisions; fourth, the change of polarity by ligating, and sixth, the formation of complete animals from quarter segments by dedifferentiation and regeneration.

She found that complete animals will develop from all quarter seg-

ments of the polyps. There seems to be no definite polarity in the first quarter because tentacles developed from the aboral end.

Mr. Karlton F. Scott of Compton Junior College has been working in the field of embryology under the able direction of Dr. B. M. Harrison. In following this line of investigation the common pocket gopher, family *Geomysidae*, has been chosen for study. Section models are being constructed of the nasal cavities and oral regions. Especial emphasis is being placed upon the development of the teeth.

The following is a list of Phi Sigma students who are carrying on research work in botany:

Harry L. Bauer has written a paper entitled, "The Survey of the Flora of the Tehachepi Mountains". This has been accepted for publication in *Ecology*.

Tema Clare has discontinued her work on the germination of the zoöspores of the Elk-Kelp, *Pelagophycus porra*, for the present pending the completion of her studies on delayed germination in the genus, *Pinus*.

Cora May Life is working on the life history and distribution of the genera *Taonia* and *Zonaria* of the order of brown algae, *Dictyotales*.

Nina Loomis is continuing her monographic study of the red algae of the order *Nemalionales*, stressing reproduction and taxonomy.

Frank W. Newton has been making a physico-chemical study of the gases of the pneumatocysts of the marine kelp, *Pelagophycus porra* and plans to continue his work on transpiration of certain cultivated plants.

Adah Stewart is making a comparative morphological study of certain genera of brown algae: *Holidrys*, *Hesperophycus*, and *Pelvetia* with special emphasis upon *Cystoseira* and *Sargassum*.

LUCILE A. GRIZZLE.

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## ALPHA BETA

### Mount Union College

During the past few weeks, four new members have been initiated by Alpha Beta Chapter: W. W. Swezy, O. N. Fellows, F. M. Dunn, and Carolyn Hilles. These initiates add considerable strength to the chapter in scholarship and research ability.

Some very interesting papers and reports have been read before the different assemblies of Alpha Beta. Among the most notable of the papers, was "The History of Medicine", by Dr. G. L. King, Jr. Paul B. Cassaday, President, is proving a zealous and untiring worker where the best for Phi Sigma is concerned.

It has been the policy of our chapter to allow the attendance of those interested whenever a particularly notable speaker is listed on the program. The only difficulty has been the securing of a meeting-place of sufficient size.

#### ALUMNI NEWS:

A. A. Yengling, W. E. Wheeler, and H. M. Crumay are progressing nicely at Harvard Medical School.

C. A. Johnson is well into the second year of his work at Johns Hopkins University.

Joseph Gledhill and the others of the Alpha Beta contingent at Western Reserve University report everything going along smoothly.

Joseph Prince is satisfied at Creighton.

Liber and Kingsbury are still attending the University of Rochester.

FLOYD O. ATCHLEY.

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## ALPHA GAMMA

### University of South Dakota

Young biologists working in mycology may find the following outline sent in by Professor Howard C. Abbott, of Alpha Gamma, of interest.

#### OVERWINTERING OF FUNGI:

##### I. Classification.

Fungi have a number of methods by which they cope with the long period during which the conditions for active life are unfavorable, as that occurring during the winter season in the north temperate climate. From a study of the literature of the subject the methods of hibernation may be grouped in the following categories:

##### A. In relation to the seed of the host.

1. Perennial mycelium within the seed.
2. Sclerotia on the surface or within the seed.
3. Spores borne within the seeds.
4. "Mycoplasma".

##### B. In relation to the vegetative parts of the host or hosts.

1. Perennial mycelium within the vegetative parts of the host or hosts.
2. Spores borne within the vegetative tissues.
3. Sclerotia within the vegetative tissues.
4. Overwintering on alternate hosts.



## C. In relation to the soil.

1. By means of spores.
2. By means of sclerotia.
3. By means of perennial mycelium.

## ALPHA EPSILON

## University of Pittsburgh

## ZOOLOGY:

In the Zoölogy Department the work going on at present divides itself logically under four heads—genetics, physiology, cytology, and morphology. All the genetic research is under the direction of Dr. P. W. Whiting, who has published extensively on inheritance in a parasitic wasp, *Habrobracon juglandis*. He is at present engaged in testing the effects of X-rays on both males and females of this species. He has succeeded in getting several visible mutations affecting eye color, body shape, wing characters, antennae, and so on, as well as evidence of lethal factors.

Mr. D. R. Charles, working on the same wasp, by selecting and inbreeding through seven generations has apparently produced a higher ratio of diploid males among the total population and an increased number of fraternities showing such anomalous males.

Mr. P. R. David has found the locus for Long Antennae to be in the same chromosome with that for Cantaloupe Eyes, but as this linkage group has not yet been tested with any other it is at present impossible to assign it to any of the known chromosomes. Mr. C. H. Bostian has found that the phenotype Cream (an eye color) is probably produced by two recessive factors located in different chromosomes. It is possible that in some stocks there are modifying factors.

Allied to the above, but not strictly genetic, is the problem of Mr. Edward McCrady, Jr. on X-ray sterility in these wasps. He has found that X-rays cause an histolysis of the ovarian epithelium and a proliferation of chorion cells at the expense of the eggs. This seems to be an osmotic phenomenon, and is therefore interesting in the light of other X-ray effects on permeability.

Finally, Miss Lorna W. Thigpen, also working under Doctor Whiting, has made a study of the comparative histology of the skins of hairless mammals with some genetic notes.

In cytology Mr. Paul R. Cutright is studying the mitochondria and

somatic chromosomes of the white mouse. Mr. George J. Dambach is working on the embryology of the whitefish (complete embryology in six hour stages); Miss Ruth Shaw's research is on the frequency and morphology of the various species of Nematodes parasitizing *Canis familiaris*.

#### PHYSIOLOGY:

In physiology Mr. G. M. McKinley has been working with a comparatively new biological tool, the High Frequency Oscillator. He has found various lethal and sub-lethal effects in Insects, and has succeeded in accelerating growth in corn by exposures of less than one minute. Above this limit the effect is inhibitory, and the degree of lethality increases steadily in exposures up to one hour. The optimum dosage has not been determined, but is apparently below fifty seconds.

Miss Jean MacCreight, working with the same instrument, is making a comparative histological study of the tissues of rats killed by this means and by pure heat. It seems possible from the present state of the work that a sufficiently high heat might produce the same results; but as the temperature of the general region between the two electrodes is in no way comparable to that required, it must be supposed that the violent oscillation of the molecules of the protoplasm itself, due to their frequently changing polarity, must produce the heat internally.

Other physiological work in progress is that of Dr. H. H. Collins and Dr. E. A. Wolf on the relation of Ultra-Violet radiation to ossification and pigmentation in Urodeles; that of Mr. E. VanSlyke with X-ray effects on the integument of *Triturus viridescens*; and that of Dr. R. T. Hance concerning X-ray effects on pigmentation, metabolism, and permeability.

#### BOTANY:

In the Botany Department there is a large and active group of workers. Dr. O. E. Jennings, Head of the Department, is at present working on the Systematics and Ecology and Botany of Western Pennsylvania. Papers of his recently published include, *A Botany Survey of Presque Isle, Pennsylvania* and a *Manual of the Mosses of Western Pennsylvania*.

Dr. J. L. Cartledge is working on pollen sterility in *Datura*, and on the chromosome numbers in certain native plants. He has been collaborating with Dr. A. F. Blakeslee, and an abstract of their progress on *Datura* pollen work was published in the *Anatomical Record* of last December.

Miss Mabel Rome is describing the morphology of *Nepeta hederacea*.

Mr. R. V. Morissey is studying the relation of plant morphology to the environment on Presque Isle. He gathered the material for this during the summer of 1929.

Mr. Warren R. Witz is studying the water plants of Presque Isle and has completed his preliminary survey. Mr. Edward H. Graham has classified some three hundred plants collected by him in British Guiana, and is preparing a synonymy.

#### MEDICAL SCHOOL:

In the Medical School Dr. Davenport Hooker of the Anatomy Department is working on spinal cord section in Goldfish. In collaboration with Dr. J. S. Nicholas of Yale he has just completed a similar piece of work on foetal rats. Independently he has recently published *Studies on Regeneration in the Spinal Cord and Rotation of a Segment of the Cord in Ambystoma Embryos*. Dr. J. C. Donaldson of the same department is working on the changes in size and cortico-medullary relations during growth and pregnancy in albino rats. He is also making a comparative study of similar changes in pigmented rats.

#### CARNEGIE MUSEUM:

Four of our members are on the staff of the Carnegie Museum. Dr. Audrey Avinoff, Director of the Museum, has financed and participated in several collecting trips to the Pamirs, India, Kashmir, Little Thibet, and Chinese Turkestan. Dr. Hugo Kahl, Curator of Entomology, has published on the *Odonata* of the Isle of Pines, and various other papers on systematic entomology. Dr. I. T. Tolmachoff has just completed a study of the corpses of the Mammoth and Rhinoceros found in the frozen ground of Siberia. This is already in the press of the American Philosophical Society. Dr. Stanley T. Brooks is studying the geographical distribution of various invertebrates. He has several papers in preparation—one on *The Distribution of the Family Pleuroceiidae in the North-eastern United States*, another on *The Land Snails of Pennsylvania*, and lastly *A Layman's Manual of Pennsylvania Snails*.

EDWARD McCrady, JR.





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2. The exterior as well as the interior appearance of the cells is demonstrated.
3. Interstitial cells are shown on the upper third of the body and in the cross section.
4. Gland cells are shown near the mouth.
5. The longitudinal section shows an amoeboid ovary and a well developed testis.
6. The muscular processes of the entoderm cells are shown in the cross section; those of the ectoderm cells in the longitudinal section.

*We shall be glad to have you write for descriptive circular.*



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## **A CORRECTION**

An inadvertent error was made in the National Secretary's office in writing that part of the letter of January 7 dealing with the proposed constitutional amendments to Article II. This letter was sent to all chapters for a vote.

The mistake was in the use of the words "Chairman" and "Vice-Chairman" rather than Chancellor and Vice-Chancellor. We wish it understood that the National Council at its meetings used the words *Chancellor* and *Vice-Chancellor* and hope that no confusion will result. The significance and meaning, in our use, is, of course, the same in either case.

While it is perhaps premature to make any statement, it might be said that the votes now in (Feb. 18, 1930) indicate the passage of all proposed amendments.

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